SNOBELEN FARMS

QUALITY WITHOUT COMPROMISE

2024

Soybean Guide

Table of Contents

Lucknow

- Head Office
- Food Grade Soybean Facility
- Commercial & I.P. Receiving Facility
- Cleaning, Processing, & Packaging Seed
- Seed Treating

Palmerston

- I.P. Receiving Facility
- Cleaning, Processing, & Packaging Seed
- Seed Treating

THE SNOBELEN FARMS DIFFERENCE

Snobelen Farms Ltd. is an independent, family-owned company that was founded in 1971. We specialize in commercial grains, pedigreed seed, and the production, processing and sales of food grade soybeans for markets across Canada and internationally. We take pride in combining years of experience with attentive customer service to complement the premium quality of our agricultural products. With eight locations we are able to serve the needs of growers across Ontario.

We specialize in:

- Multiplying, processing, and selling the best genetics for our area
- Testing and growing the varieties that work for the farmer and the end users
- Selling certified seed to farmers and retailers across Ontario

The Canadian Identity Preserved Recognition System Plus HACCP (CIPRS+ HACCP) consists of a check mark held by two hands over a grain field. The use of the CIPRS+ HACCP mark must indicate that the company is "certified under CIPRS+ HACCP".

Lucknow 1-800-582-5669 **Palmerston** 1-877-343-3630 ***www.snobelenfarms.com***

The Seed Team

CALVIN BROWN
Seed Business Manager
Associate Diploma Agriculture
Business, University of Guelph
cbrown@snobelenfarms.com
Cell: 519-851-0300
@snobelenseeds

BRENDAN ZETTLER
Production Agronomist
B. Sc. Agriculture;
University of Guelph
Certified Crop Advisor, Ontario
bzettler@snobelenfarms.com
Cell: 519-389-7591
@formosafarmer

SHERRI HALDENBY
Seed Administrator
Lucknow
shaldenby@snobelenfarms.com
Office: 519-528-2092
Cell: 519-525-1367
@haldenbysherri

TERESA TEUNE
Seed Administrator
Palmerston
B. Sc. Agriculture;
University of Guelph
tteune@snobelenfarms.com
Office: 519-343-3630

Soybean Traits

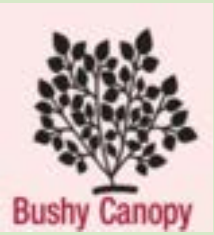
Herbicide Tolerance	Conventional	Roundup Ready 2 Yield Soybeans	Roundup Ready 2 Xtend Soybeans	Xtendflex Soybeans	Enlist E3 Soybeans
Glyphosate	✗	✓	✓	✓	✓
2, 4 - D	✗	✗	✗	✗	✓
Glufosinate	✗	✗	✗	✓	✓
Dicamba	✗	✗	✓	✓	✗

Packaging Size

	Bags	Totes	Bulk
Conventional Soybeans	50 lbs	2,000 lbs	50 lbs / Unit
Traited Soybeans	140,000 Seeds	5,600,000 Seeds	140,000 Seeds / Unit

Self Applied Inoculant	Form	Size	Quantity Treated
Lalfix Peat	Peat	1.2 Kg	Full Rate: 30 Units Half Rate: 60 Units
Lalfix Liquid	Liquid	1.1 L	Full Rate: 50 Units Half Rate 100 Units

Plant Architecture



Soybean Variety Description

Food Grade

Yellow Hilum

OAC Strive
- Impressive emergence and early season growth
- Ideally suited for 7" to 15" rows
- Good on all soil types

OAC Lakeview
- High yielding, stable performance across most environments
- Excellent tolerance to Phytophthora root rot

OAC Kamran
- SCN Resistant
- Excellent lodging score
- Short to medium plant stature

OAC Malory
- SCN Resistant
- Excellent yield potential
- Excellent field appearance

NEW **Inwood**
- SCN Resistant
- Good tolerance to sudden death syndrome
- Suited for all soil types
- Narrow canopy with medium plant height

NEW **OAC Union**
- SCN Resistant
- Strong yield potential
- Medium tall plant suited for narrow rows
- Suited for all soil types

OAC Bruton
- SCN Resistant
- Phytophthora root rot resistant
- Tall plant height
- Well suited for clay soils

Dark Hilum

OAC Wallace
- High yielding variety in both wet and dry areas
- Performs well in conventional and no-till operations

Soybean Variety Description

Technology Traited R2 + R2X + XF	
Mahony R2 • Bushy plant type • Good podding height • An aggressive high yielding early variety	NEW **Triquet R2X** • SCN Resistant • Strong yields for maturity • Above average white mould rating • Medium tall variety
NEW **Mason XF** • SCN Resistant • Bushy tall variety • Suited for no-till and clay soils • Good disease package	**Ramage XF** • SCN Resistant • New XtendFlex variety with three modes of action • Excellent standability
Savage R2X • SCN Resistant • Excellent yield potential • Strong performer in drought situations	**Altitude R2** • Top yielding potential • Good podding height and no pod shatter
ORR R2X • SCN Resistant • Good white mould rating • Moderate field tolerance to Phytophthora root rot	NEW **Ridley XF** • SCN Resistant • Versatile performer on different soil types • Medium plant height with bushy canopy • Suited for all row widths

Food Grade Characteristics

	OAC Strive	OAC Lakeview	OAC Kamran	OAC Malory	Inwood	OAC Union	OAC Bruton	OAC Wallace
CHU Rating	2650	2700	2725	2800	2875	2875	2975	2750
Maturity Group	0.4	0.5	0.6	1.2	1.4	1.4	2.0	0.7
Hilum Colour	Imperfect Yellow	Yellow	Imperfect Yellow	Yellow	Imperfect Yellow	Yellow	Yellow	Brown
Plant Height	Medium-Tall	Medium	Short-Medium	Medium-Tall	Medium	Medium-Tall	Medium	Medium-Tall
Canopy Type	Narrow	Intermediate	Narrow	Intermediate	Narrow	Narrow-Intermediate	Intermediate	Intermediate
Lodging*	1.8	1.7	1.1	1.6	2.3	1.1	1.3	1.7
Row Width**	7" - 15"	7" - 15"	7" - 15"	7" - 30"	7" - 30"	7" - 15"	7" - 30"	7" - 15"
Soil Type	All	All	All	All	All	All	Clay	All
Protein (%)	44.0	39.9	42.4	42.6	42.0	40.3	42.5	38.2
White Mould Rating	Above Average	Average	Average	Above Average	Average	Average	Average	Average
SCN	NO	NO	YES	YES	YES	YES	YES	NO

***Lodging: 1 = Excellent, 5 = Poor; ** Recommendation; *** Seeds/lbs**

Technology Traited Characteristics

	Mahony R2	Triquet R2X	Mason XF	Ramage XF	Savage R2X	Altitude R2	Orr R2X	Ridley XF
Soybean Traits								
CHU Rating	2350	2475	2600	2675	2675	2725	2750	2750
Maturity Group	00.3	00.9	0.2	0.5	0.5	0.6	0.8	0.8
Hilum Colour	Black	Black	Black	Imperfect Yellow	Black	Brown	Brown	Black
Plant Height	Medium	Medium-Tall	Tall	Medium	Tall	Medium - Short	Medium-Tall	Medium
Canopy Type	Bushy	Intermediate	Bushy	Intermediate	Bushy	Intermediate	Bushy	Bushy
Lodging*	1.5	1.8	2.5	1.5	2.2	1.3	1.4	1.5
Row Width**	7" - 30"	7" - 15"	7" - 30"	7" - 30"	7" - 30"	7" - 30"	7" - 30"	7" - 30"
Soil Type	All	All	Clay	All	All	All	All	All
White Mould Rating	Average	Above Average	Average	Average	Average	Above Average	Average	Average
SCN	NO	YES	YES	YES	YES	NO	YES	YES

***Lodging: 1 = Excellent, 5 = Poor; ** Recommendation**

Seeding Rates

Number of Seeds/Lb	7.5" Row 194,000 seeds/acre (2.8 seeds/ ft. row)	15" Row 177,000 seeds/acre (5.1 seeds/ ft. row)	22" Row 172,000 seeds/acre (7.2 seeds/ ft. row)	30" Row 162,000 seeds/acre (9.3 seeds/ ft. row)
	Pounds / Acre Seed			
1800	108	98	96	90
2000	97	89	86	81
2200	88	80	79	74
2400	81	74	72	68
2600	75	68	66	63
2800	69	63	62	58
3000	65	59	58	54
	157,000 plants/acre (2.3 plants/ ft. row)	143,000 plants/acre (4.1 plants/ ft. row)	139,000 plants/acre (5.9 plants/ ft. row)	131,000 plants/acre (7.5 plants/ ft. row)

Seeding Rate in pounds/acre for each common row spacing and recommended seeds/acre (seeds/ft. of row)
Seeding rates are based on having a germination of 90% and an emergence of 85-90% (plant stand of 76-81% of seeding rate)
Derived from: PUB 811, Table 2-11

Optimum Planting Date

Planting Date	Yield (bu/acre)	Percent of Full Yield (%)
April 15 - May 5	63.8	100
May 6 - May 20	63.3	80
May 21 - June 5	58.3	92

Seeds Per Foot Row

Row Spacing (inches)	Linear Feet of Row Per Acre	Desired Plant Population per Acre						
		105,000	110,000	130,000	150,000	175,000	200,000	225,000
		Seeds per Foot Row						
30	17,424	6.0	6.3	7.5	8.6	10	11.5	12.9
22	23,760	4.4	4.6	5.5	6.3	7.4	8.4	9.5
15	34,848	3.0	3.2	3.7	4.3	5.0	5.7	6.5
10	52,272	2.0	2.1	2.5	2.9	3.3	3.8	4.3
7.5	69,696	1.5	1.6	1.9	2.2	2.5	2.9	3.2

Derived from: Mississippi State University Extension Service

Seeding Depth

Soybean seed is very sensitive to planting depth. Under most conditions, soybeans should be planted around 1.5 inches deep. However, since soybean seed has a high water demand for germination, it is important to plant ½ inch into moisture. It is also important to achieve good seed-to-soil contact and to close the seed slot.

As a general rule you can plant shallower when:

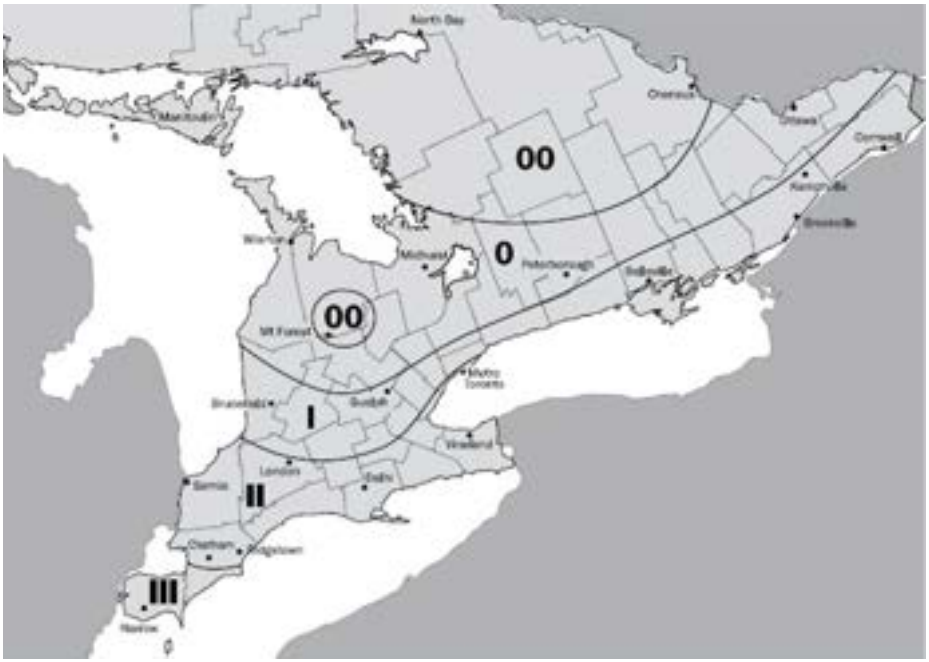
- Early planting
- High residue conditions
- Fine textured soils
- Moist soils

You may have to plant deeper when:

- Late planting
- Coarse textured soils
- Dry soils

The range of planting depth, depending on the conditions, is 1" – 2.5".

Ontario Soybean Maturity Map

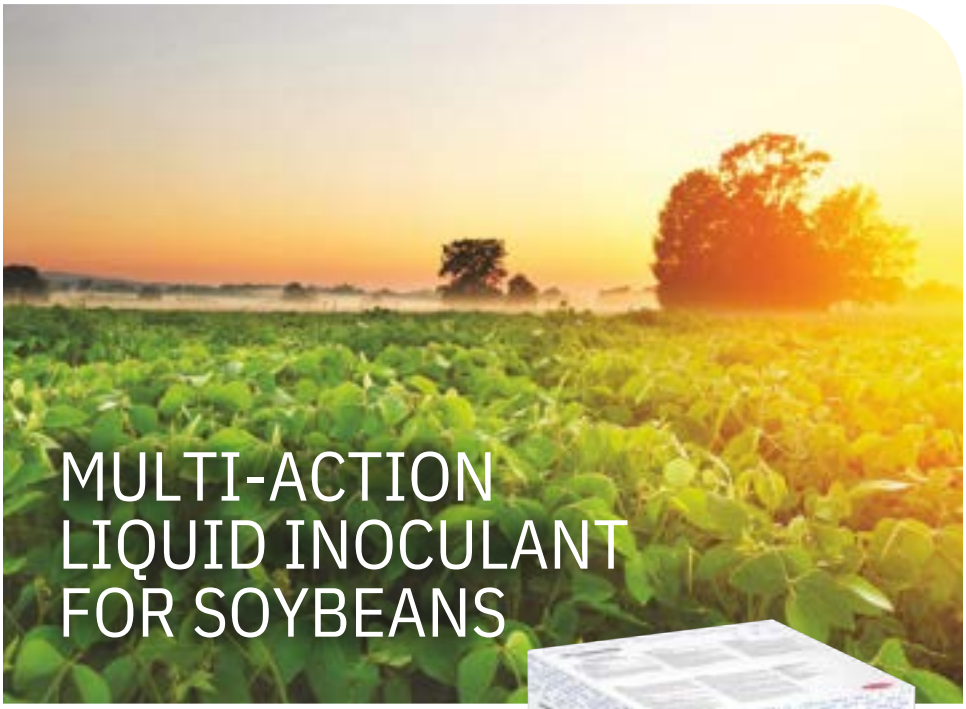


Source: Ontario Soybean and Canola Committee, 2019

Population Reduction/Yield Potential Relationship

Plants Per Acre	Optimum Stand	Optimum Yield
157,000	100%	100%
118,000	75%	98%
78,000	50%	90%
39,000	25%	75%

LALFIX PROYIELD
LIQUID SOYBEAN



LALFIX® PROYIELD Liquid Soybean is a new leading formulation liquid inoculant in an easy to use single package, no mixing required.

The two unique strains of Bradyrhizobium elkanii bring soybean growers an innovative inoculant with higher rhizobia survival and competitiveness.

In addition, Delftia acidovorans increases root growth, nutrient and water uptake –

ultimately
leading to enhanced nodulation and nitrogen fixation, early vigor and higher soybean yields. Delftia acidovorans is also known to produce a significant amount of chaperone molecules that help solubilize iron and sulfur for soybean availability.

Microbial By Nature

www.lallemandplantcare.com

LALLEMAND
LALLEMAND PLANT CARE

SOYBEAN NODULATION SCORECARD

SOYBEAN

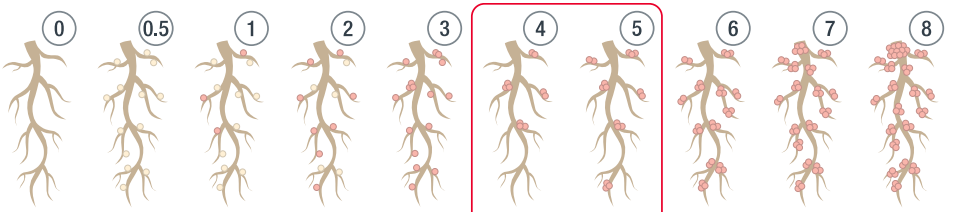
Tools Required

- Shovel
- Water
- Two Pails
- White Display Board
- Camera
- Ruler
- Notebook
- Pocket Knife

SCOUTING GUIDELINES

- Determine crop stage prior to nodulation assessment.
- Select up to 3 areas throughout entire field that accurately reflect field variability.
- Dig up 3 plants from each area with generous amounts of surrounding soil. Be sure to handle carefully, keep maximum root and nodule tissue intact.
- Pour water over soil and lightly agitate the roots to clean. (In heavy soil use a plastic bag, fill with water to cover the root system, add a few drops of dish soap and shake - so the roots are clean, and nodules are easy to see)
- Note the number of nodules, their size and where they are attached on the root. Use the knife to cut a few nodules in half and note the color inside. Include other field notes such as presence of root diseases which may impact yield.

PLANT RATING SCORECARD



0	0.5	1	2	3	4	5	6	7	8
Absent	Ineffective	Rare (Effective)	Scarce	Moderate	Adequate	Ample	Abundant	Very Abundant	Extremely Abundant
No nodules	White ineffective pink nodules	0-5 small 1-2 large pink nodules	6-10 small 3-4 large pink nodules	11-20 small 5-9 large pink nodules	21-40 small pink nodules	< 40 small pink nodules	pink and/or pink and/or pink and/or ≤ 10 small pink nodules	Crown nodulation < 5 mm diameter	Crown nodulation ≥ 5 mm diameter

Yates R.J., Howieson J.G., Real D., Reeve W.G., Vivas-Marfisi A. and O'Hara G.W. 2005. Evidence of selection for effective nodulation in the **Trifolium** spp. symbiosis with **Rhizobium leguminosarum** biovar trifolii. Australian Journal of Experimental Agriculture 45, 189–198.

SOYBEAN SINGLE VS. DOUBLE INOCULANT CONSIDERATIONS

Why do we Inoculate Soybeans?

Research shows that soybeans which are inoculated can provide soybean plants up to 74% of the nitrogen they require through the growing season. The following document is meant to be used to help gauge whether to consider single or double inoculating your soybeans. If two or more boxes to the right are applicable to you, please consider double or stacking inoculant to ensure your greatest yield potential.

FACTORS TO CONSIDER	WHEN TO SINGLE INOCULATE	WHEN TO DOUBLE INOCULATE
A) Virgin Soil	There must be adequate levels of rhizobium in the soil within close proximity of the seed. Since bradyrhizobium isn't native, the only way to establish a population is by inoculating and establishing successfully nodulated soybean crops	When planting into virgin soils the impact of nodulation can be great on overall yield. Yield drag can be seen in virgin soils and by double inoculating you can create soil reserves of bradyrhizobium quickly
B) Soybean Rotation	In a short rotation (1-3 Years), recent history of bradyrhizobium application leaves more highly efficient bacteria in the overall population in the soil. A single application of inoculant provides efficient clones for secure nitrogen production	In a long rotation (4-8 Years) you will want to double inoculate soybeans as the overall bacteria population in the soil becomes less efficient and less populated over time
C) pH Level	Rhizobia perform best in the pH range of 5.8 - 7.0, as plants can optimally communicate via exudates with the rhizobium	Soil pH of <5.8 and >7.0 can highly impact the level of inoculation. Soil which is acidic or basic creates challenges for signals to be transmitted from soybean roots to rhizobium. The use of soil amendments can impact the pH, such as the use of lime
D) Moisture	Moisture during the growing season can help ensure strong nodulation when inoculant is used. Inoculation can be impacted by stressful soil conditions, which can include both excessive moisture and or drought conditions	Moisture stress can impact the number of flavonoids produced by the plant. Therefore, placing large populations of fresh bradyrhizobium through inoculant can preserve nodulation under stress
E) Soil Type	Well drained, medium textured soils with a range of 1.5% - 3% organic matter provide the most stable environment for rhizobium to thrive in	Sandy conditions, soils with high organic matter (>3%) and compaction can cause a difference in water holding capacity and fluctuating oxygen levels. Double inoculation can help mitigate these stresses which can lead to rhizobium desiccation
F) History	If there's a history of certain fields with poor nodulation, it's likely to have one or more of the underlying issues already discussed. Corrective actions should be considered to help improve overall soybean health. The use of inoculant will be an important component	If there's a field history of poorly nodulated soybeans, caution should be taken going into the next cropping cycle. The impact of double inoculation can be highly profound and can greatly affect the overall benefit to the crop in these situations

LALLEMAND

LALLEMAND PLANT CARE

Other Considerations

Manure

What to watch for: Manure can be a great source of nitrogen for many crops, but keep in mind that in some cases it takes multiple seasons for it to breakdown into plant available forms. With the increased nitrates soybeans can become overly vegetative and can experience challenges with plant health.

Possible Solution: Soil tests can be utilized to ensure soil nitrogen isn't abundant and allow for the nodulation process to begin. For a preseason 6-inch nitrate test, 20-60lbs of nitrogen is optimal. Anything above this can cause issues with nodulation, timing and intensity.

Introduction of a New Species of Rhizobium

What to watch for: In areas where soybeans have been planted for a multitude of years, the native rhizobium population in the area may have a level of ineffectiveness due to genetic changes overtime. The use of fresh inoculant and new highly efficient rhizobium in high populations with close proximity to the seed is highly recommended for optimal results. In soils with established populations, inoculant drives a greater proportion of active vs. inactive nodules regarding biological nitrogen fixation.

Possible Solution: The use of a second inoculant as a double inoculation or introduction of a new species of inoculant will allow you the best opportunity to increase diversity of species and strains. Seed placed and in furrow placed inoculant is critical to ensure maximum benefit to the early development of the crop.

Above Average Temperatures and Rainfall

What to watch for: In extremes we can see the movement of rhizobium from the seedbed into deeper layers of the rhizosphere.

Possible Solution: It's all about location and it's critical for the placement of rhizobium to be in the furrow and around the seed at planting. Establishing fresh inoculant each spring helps ensure strong potential nodulation for your crop.

Iron Deficiency Chlorosis

What to watch for: Soils with a high pH, poor drainage, salinity or a large degree of organic matter can all impact early soybean growth and iron availability. These conditions may increase the likelihood of iron deficiency chlorosis symptoms.

Possible Solution: Inoculant can be part of a multi-faceted approach to this problem; the use of an iron fertilizer or an inoculant capable of iron insolubility is also encouraged.

Active vs. Inactive Nodules

What to watch for: Active nodules begin around V2-V3 and when sliced open have pink to red centre's which show they are producing nitrogen in the soil. Nodules which are small and white may be immature and have not started fixing nitrogen. The appearance of green, brown or mushy nodules are not fixing nitrogen. The ineffective nodules can be a result of a multitude of issues, listed throughout this document. Keep in mind soybeans will cycle through fresh nodules every few weeks, the healthy nodules will senesce, and new nodules will form along the root up until the plant reaches R5 (pod fill).

Possible Solution: Consult the nodulation scouting guide to learn more about the proper technique of scouting and evaluating nodules on soybeans. If healthy nodules aren't found with initial scouting come back in a week's time to reassess the nodulation. If this persists, consult your agriculture representative for next steps in rescuing the crop.

LALFIX PROYIELD

Snobelen Farms Seed Applied Inoculant

- Soybean Inoculant applied by Snobelen farms with either a Fungicide or Fungicide + Insecticide creating the complete package for dump and go solutions for farmers.
- Snobelen Farms utilizes their state of the art facilities to apply the seed treatments with precision to every soybean so that you can be assured that each plant has the best start in the field.


MULTI–ACTION LIQUID
INOCULANT FOR SOYBEANS

LALFIX® PROYIELD Liquid Soybean is a leading liquid inoculant containing *Bradyrhizobium elkanii* and *Delftia acidovorans*. Lallemand Plant Care utilizes two unique strains of *Bradyrhizobium elkanii* to bring soybean growers an innovative inoculant with higher rhizobia survival and competitiveness. In addition, *Delftia acidovorans* increases root growth, nutrient and water uptake – ultimately leading to enhanced nodulation and nitrogen fixation, early vigor and higher soybean yields. In partnerships with university research extensions, *Delftia acidovorans* is known to produce a significant amount of chaperone molecules that help solubilize iron for soybean availability.

Snobelen Farms offers 2 options for farmer applied Lallemand Inoculants

LALFIX LIQUID SOYBEAN

- Dual Strain Liquid Inoculant for soybeans applied directly to the soybean seeds as you are filling your planter/seeder
- Easy application and flowability of the seed
- Must be mixed with water at 1:1 ratio to apply to the soybean seed.
- Once applied to seed, plant within 30 days. Keep out of sunlight in cool dark area.

Packaging- 1.1 L bladder
Rate- 44.5ml/ 100 lbs of seed

Full Rate- 50 units/ 1.1 L
Half Rate- 100 units/1.1 L

LALFIX PEAT SOYBEAN

- Dual Strain Peat Inoculant for soybeans applied directly to the soybean seeds as you are filling your planter/seeder
- Easy application and flowability of the seed
- Can be used to double inoculate first- year soybean fields or to fields with lower carryover of background rhizobia
- Once applied to seed, plant within 48 hours. Keep out of direct sunlight.

Packaging- 1.2 Kg package
Rate- 80g/ 100 lbs of seed

Full rate- 30 units/ 1.2 kg
Half rate- 60 units/1.2 kg

Lucknow 1-800-582-5669 Palmerston 1-877-343-3630 *www.snobelenfarms.com*

Fortenza Vayantis IV Seed Treatment

Fortenza Vayantis IV is a new non-neonicotinoid soybean seed treatment that can be applied as a commercial seed treatment. Four active ingredients deliver control of European chafer, June beetle, wireworm and seed corn maggot, while protecting growing soybean seedlings from the following diseases:

- Seed rot, damping off and seedling blight cause by Fusarium spp., Pythium spp. and Rhizoctonia spp.
- Seeding root rot caused by Fusarium spp.
- Seed rot and seedling blight caused by Phomopsis spp.
- Early season root rot caused by Phytophthora megasperma var. sojae (1)

Fortenza Vayantis IV Even under heavy insect and disease pressure, Fortenza Vayantis IV helps producers build a strong soybean stand with faster, more uniform growth.

In seed corn maggot trials conducted at the Honeywood Research Farm in Plattsville, Ontario, soybean stands treated with Fortenza fared better than infested checks treated with a fungicide base.

Fungicide base (infested check)

Fortenza @ 50g + Fungicide base

Photos taken at the Honeywood Research Farm in Plattsville, Ontario, in July 2016.
N=12 Performance evaluations are based on field observations and public information.
Data from multiple locations and years should be consulted whenever possible.
Individual results may vary depending on local growing, soil and weather conditions.
1 Vayantis IV RFC provides early season protection against Phytophthora root rot for tolerant varieties of soybeans.
Courtesy of Syngenta Canada

Vayantis IV Seed Treatment

The broadest Phytophthora and Pythium protection available

- Contains 4 active ingredients - with one completely new mode of action
- Provides an average yield bump of 1.6 bu/acre when compared to Vibrance® Maxx RFC in trials
- Faster emergence and improved stand with better root growth in high phytophthora pressure

Source: Syngenta trial near Jarvis, ON, 2021

Broad-spectrum disease activity

Vayantis IV protects soybeans against:

- ***Phytophthora*** *megasperma* var. *sojae* (early season root rot)
- ***Rhizoctonia*** spp. (seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight)
- ***Pythium*** spp. (seed rot/pre-emergence damping-off, post-emergence damping off, seedling blight)
- ***Fusarium*** spp. (seed rot/pre-emergence damping-off, post-emergence seeding blight and seedling root rot)
- Seed-borne ***Phomopsis*** spp. (seed rot and seedling blight)

Vayantis IV

Protect your investment

With NK seed, we tap into the latest Seedcare™ innovations from Syngenta, so you can protect your investment against early- season insect and disease threats.

We're offering a choice of two soybean Seedcare packages with the option to add Saltro® on select varieties.

	DISEASES CONTROLLED CAUSED BY						INSECTS							
	Fusarium	Rhizoctonia	Pythium	Phomopsis	Phytophthora megasperma var. sojae	Sudden death syndrome	Bean leaf beetle	Black cutworm	European chafer	June beetle	Seed corn maggot	Soybean cyst nematode	Wireworm	
PACKAGE 1														
Vayantis™ IT	●	●	●	●	●									ROOTING POWER
PACKAGE 2														
Fortenza	●	●	●	●	●		●	●[1]	●	●	●		●	
Vayantis™ IT	●	●	●	●	●									ROOTING POWER
ADD-ON OPTION														
Saltro®						●						●		

Legend

● Control

[1] Use for early season feeding damage from bean leaf beetle.

For more information, contact your Syngenta Representative, our Customer Interaction Centre at 1-87-SYNGENTA (1-877-964-3682) or visit Syngenta.ca/NK

Diseases

Rhizoctonia Seedling Blight

Rhizoctonia seedling blight is caused by the fungus Rhizoctonia solani. The characteristic symptom of this seedling blight is reddish brown lesions on the seedling's lower stem or hypocotyl, usually at the soil level. Lesions on the diseased stem appear sunken and dry.

Agronomic Tip

Soybeans remove a tremendous amount of potassium (approximately 70 lb/acre for a 50 bu/acre crop)

Soybean Cyst Nematode

Symptoms initially begin with slow canopy closure often mistaken as a herbicide failure early in the season. Plant height is affected, resulting in short plants next to tall plants. Poor fertility can enhance above-ground symptoms and are similar to potassium deficiency and sometimes nitrogen deficiency. Poor stands and death are possible. Young female SCN can be found on plant roots in the field most readily when plants begin to flower. There is a common interaction with Sudden Death Syndrome.

Diseases

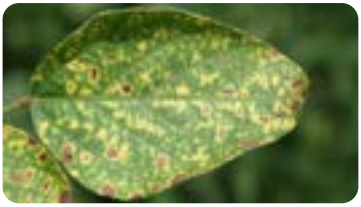
Pythium Seedling Blight

Many Pythium species can cause soybean seedling blight and appears similar to Phytophthora root rot. Pythium seedling blight symptoms include rotten, mushy seeds or seedlings with poorly developed roots. Water-soaked lesions may be present on the hypocotyl or cotyledons. Pythium seedling blight can occur across a range of temperatures, but high soil moisture increases disease severity. Consequently, symptoms are most severe in poorly drained soils and areas prone to flooding.

Phytophthora Root Rot

Phytophthora root rot is caused by the oomycete Phytophthora sojae. Infected plants appear alone or in patches. The disease causes a stem rot characterized by chocolate brown stem lesions, but the symptoms of the seedling phase resemble the symptoms of many other seedling diseases. Phytophthora infected seedling stems are soft and water-soaked. Overall, infected seedlings will wilt and be stunted. Phytophthora root rot occurs across many environments, but is most common in warm (15 degrees Celsius) and in wet conditions.

Diseases



Frog Eye Leaf Spot

Typical symptoms are leaf lesions that are circular with a purple margin around an ashy-white/gray center. Lesions begin as dark, water-soaked spots on the younger leaves. As the lesions age, the centers become ash-gray or light brown. Lesions often coalesce to form larger, irregular spots. Timely fungicide applications, when thresholds have been observed, will control frog eye leaf spot.

Sudden Death Syndrome (SDS)

This is a disease that is starting to show up in Huron & Bruce Counties. Symptoms usually begin during the flowering stage and get progressively worse by the R6 growth stage. Small yellow spots first appear on the upper leaves and progress into yellow streaks and eventually become necrotic with only the veins remaining green. Roots of infected plants are usually rotted, and plants can be easily pulled out of the soil. The pith tissue will remain white, while the water-conducting tissue (xylem) will have a gray to brown colour. Many times SDS symptoms will be more severe in the presence of soybean cyst nematodes and may be worse after a rotation with corn that had severe stalk rot the previous year.

Diseases derived from: Crop Protection Network, University of Tennessee Extension, Cornell University, North Dakota State University, Mississippi State University Extension, University of Nebraska-Lincoln, OMAFRA Pub. 811

Diseases

White Mould

White mould is caused by the fungus *Sclerotinia sclerotiorum*. The fungus is easily recognized by the presence of fluffy white mycelium (the vegetative body of the fungus) that is the source of the name white mould. Each year, the occurrence of white mould is heavily dependent on weather conditions during soybean flowering and early pod development. Rain, moderate temperatures (less than 28° C), high relative humidity and moist soil favour the growth of the fungus if it is present.

Sclerotia germinates to form mushroom-like structures called apothecia. Apothecia are tan coloured, have a sponge-like texture and are 1/4 to 1/2 inch wide at maturity. They are found on the soil surface and form from sclerotia when the soil is moist and dim light is filtered through the crop canopy. Under the cap of the apothecia, microscopic spores (ascospores) are produced and forcibly ejected. The disease cycle of white mould begins when ascospores germinate and colonize on senescing flower petals that adhere to emerging pods. Infection eventually progresses from pods to other nodes and stems, resulting in a premature death of stems. If adjacent plants come into contact with an infected plant, they may also become infected, but plant to plant spread of the pathogen is minimal and not as important as infection of blossoms.

Sclerotia are formed from the white mould fungus growing on and inside stems and pods. Sclerotia that are formed on stems and pods eventually fall to the soil surface. Those formed inside stems and pods are released when plants pass through the combine at harvest and are deposited on the soil surface.

Insects

Seed Corn Maggot

The seed corn maggot is a pale, yellowish-white larva found burrowing into soybean seeds. Full grown maggots are legless, about 6 mm long, cylindrical, narrow, and tapered. The maggot lacks a defined head and legs, but has small black mouth hooks at the front of its body. Fields in which animal or green manure crops have been used have a greater potential for seed corn maggot attack than fields not using these manures. However, non-manured fields are also at risk from seed corn maggot damage. Plant injury is especially prevalent during cool and wet springs.

Wireworm

Wireworms are slender, hard-bodied, wire-like beetle larvae that can damage young soybean plants. They are shiny yellow to brown in color and range in size from 1/2 to 1-1/2 inches long. Wireworms can feed on and damage one or more portions of a soybean seed or can completely hollow it out, leaving only the seed coat. Wireworms may also cut off small roots or tunnel into the underground portions of young soybean plants. These plants will appear stunted or wilted. Damage to either the seed or seedling can result in gaps in the rows. Soybean fields likely to be attacked by wireworms are those in which sod or small grains were grown the previous year(s), or which have a history of wireworm damage.

Insects

Bean Leaf Beetle

Bean leaf beetles (BLB) vary in colour, but are usually reddish to yellowish-tan. They are about 5-8 mm long and commonly have two to four black spots and a black border on the outside of each wing cover. These spots may be missing, but in all cases there is a small black triangle at the base of the wings near the thorax. The BLB overwinters in the adult stage, and resumes activity in the spring. It will be found feeding on soybean foliage soon after soybean emergence.

Soybean Aphid

Soybean aphids are small, yellowish-green, soft-bodied insects with 2 distinctive appendages (cornicles) on the tip of their abdomen. They may be winged or wingless. If present, aphids can easily be found on newly unfolding leaves and the under surface of the uppermost leaves. In high populations soybean aphids can also be found on stems, petioles, pods and the under surface of lower leaves. Indications of a soybean aphid infestation can include stunting of plants, yellowing and miss-shaped or contorted leaves, an obvious presence of natural enemies such as lady bird beetles or ants in the uppermost canopy, and a charcoal gray discolouration of leaves indicating presence of sooty mould. Yield loss is greatest when soybeans are in the early R stages.

Insects

Two-Spotted Spider Mite

The adults are very small, about 1/60 of an inch, and can be white, green, orange or red. They have four pairs of legs, which is a characteristic that distinguishes them from insects that have three sets. A set of reddish to brownish spots on their back give the species its common name. The larva and nymph look similar to the adult but are smaller. The larvae have only three sets of legs. Early symptoms of spider mite injury appear as leaves with a yellow stippled look along the field margins. As the populations continue to build and injury increases, the yellowing spreads across the field and the area of yellow leaves expands and may turn red. The underside of leaves will have significant silk webbing and small, white spots that are the cast skins of the mite. If the population is not controlled, the yellow leaves will turn brown as the leaf loses moisture and dries up. Continued dry conditions and increasing mite populations can result in the significant loss of leaf area and death of plants.

Insects derived from: University of Minnesota Extension, University of Nebraska-Lincoln, University of Wisconsin Extension, Iowa Soybean Association, and Iowa State University Extension.

Metric & Imperial Conversion Charts

Length	
1 millimeter (mm)	0.04 in
1 centimeter (cm)	0.39 in
1 meter (m)	3.28 ft : 1.09 yd
1 kilometer (km)	0.62 mi
1 inch (in)	0.30 m : 0.33 yd
1 foot (ft)	0.30 m : 0.33 yd
1 yard (yd)	3 ft : 0.91 m
1 mile (mi)	1.6 km

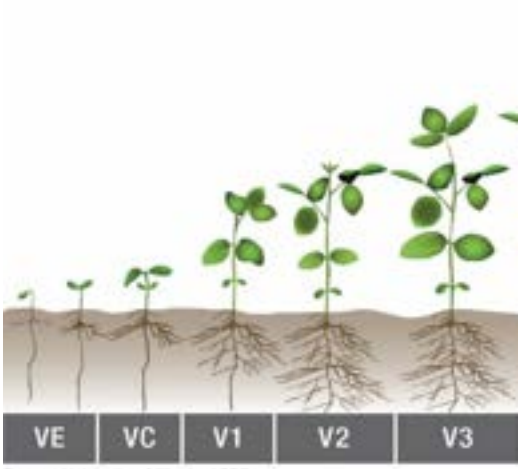
Area	
1 sq cm (cm2)	0.16 in2
1 sq m (m2)	10.76 in2 : 1.2 yd2
1 hectare (ha)	2.47 ac : 10,000 m2
1 sq km (km2)	0.39 mi2 : 247.11 ac
1 sq inch (in2)	6.45 cm2
1 sq ft (ft2)	0.09 m2 : 929 cm2
1 sq yd (yd2)	0.84 m2 : 8361 cm2
1 acre (ac)	0.40 ha
1 sq mile (mi2)	2.59 km2 : 258.9 ha

Weight	
1 gram (g)	0.035 oz
1 kilogram (kg)	2.205 lbs
1 metric ton (MT)	1,000 kg : 2,205 lbs
1 US ounce (oz)	28.35 g
1 pound (lb)	0.454 kg
1 ton (2,000 lbs)	907 kg

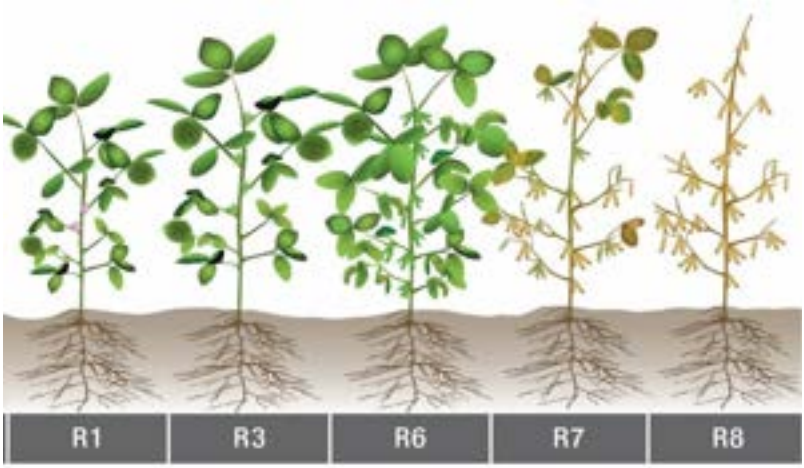
Volume	
1 cubic cm (cu cm)	0.06 cu in
1 cubic decimeter	61.02 cu in : 0.04 cu ft
1 cubic meter (cu m)	35.32 cu ft : 1.31 cu
1 liter (L)	0.26 U.S. gal : 1.06
	0.22 imp gal : 0.88
	61.02 cu in : 1,000
1 cu in	16.29 cu cm
1 cu ft	28.32 L
1 cu yd	0.76 cu m : 764 L
1 quart (U.S.)	0.95 L
1 quart (British)	1.14 L
1 gallon (U.S.)	3.79 L
1 gallon (British)	4.55 L

Product conversion		
	BU/MT	Lbs/BU
Wheat	36.74	60
Oats	64.84	34
Barley	45.93	48
Rye	39.37	56
Canola	44.09	50
Soybeans	36.74	60
Buckwheat	45.93	48
Corn	36.37	56

Soybean Growth Stages



Source: University of Illinois, 1999



Notes

snobelenfarms.com

Lucknow
323 Havelock Street, Box 29
Lucknow Ontario
N0G 2H0
Phone: 1-800-582-5669
Fax: 519-528-3542

Palmerston
5220 King's Hwy 23
Palmerston Ontario
N0G 2P0
Phone: 1-877-343-3630
Fax: 519-343-2037